

WE CLAIM:

1. A method for connecting link aggregation compatible devices over a communication network comprising:

5 (a) receiving a request to establish a connection between said devices, said connection being defined by specific traffic parameters;

(b) detecting a plurality of maximally disjoint paths between said devices, said maximally disjoint paths being formed by compatible physical links; and

10 (c) establishing said connection over two or more logical links along a respective two or more maximum disjoint paths and aggregating said logical links into a virtual path having said specific traffic parameters.

2. A method as claimed in claim 1, wherein said specific traffic parameters include the bandwidth of said connection.

15 3. A method as claimed in claim 1, wherein a maximum disjoint path comprises one or more successive physical links connecting a port of a first device with a corresponding port of a second device and all the nodes of said network, said physical links being selected based on their physical
20 characteristics.

4. A method as claimed in claim 3, wherein a corresponding port is a port having similar specific traffic parameters.

25 5. A method as claimed in claim 4, wherein one of said specific traffic parameters is the port rate.

6. A method as claimed in claim 2, wherein the sum of the bandwidth of all logical links provides the bandwidth of said connection.

30 7. A method as claimed in claim 1, wherein (c) comprises:

selecting a group of one or more logical links for supporting said connection;

trying to aggregate said logical links of said group into said virtual path;
in case of failure, ending said link aggregation; and

5 in case of success, establishing each said logical links of said group by allocating an input and an output port on each network node along each said maximally disjoint paths, aggregating said logical links into said virtual path, and exchanging traffic between said devices along said virtual path.

10 8. A method as claimed in claim 1, further comprising:

monitoring each said logical links of said virtual path for failure; and
in the case of a failed physical link on any logical link:

detecting a fault indication at the two end nodes of said failed physical link; and

15 signaling said fault indication to a first and a second edge nodes connecting said devices over said network.

9. A method as claimed in claim 1, wherein said communication network is an Ethernet network.

20 10. A method as claimed in claim 1, wherein said network is a metropolitan area network (MAN).

25 11. A switching node of a communication network for routing traffic between near end and far end data terminals, comprising:

a plurality of input ports and output ports, each port having specified traffic parameters;

30 a link aggregation interface for assigning an input port and a corresponding output port to a physical route between said near end and said far end data terminals under supervision of a node controller; and

a switch for routing traffic between said input port and said corresponding output port according to a connectivity map and establishing communication between said near end and said far end data terminals along a logical link.

5 12. A switching node as claimed in claim 11, wherein said link aggregation interface updates said connectivity map with information on said physical route.

10 13. A switching node as claimed in claim 11, further comprising means for failure detection.

15 14. A switching node as claimed in claim 13, wherein said means for failure detection monitors said input port and generates a fault indication whenever said physical route is interrupted upstream from said switching node.

 15. A switching node as claimed in claim 14, further comprising means for failure communication, for propagating said fault indication towards edge nodes connecting said data terminals over the network.

20 16. A switching node as claimed in claim 14, wherein said fault indication is caused by a failed physical link.

 17. A switching node as claimed in claim 14, wherein said fault indication is caused by a dead node.

25 18. A system for connecting link aggregation compatible devices over a communication network comprising:

 means for receiving a request to establish a connection between said devices, said connection being defined by specific traffic parameters;

means for detecting a plurality of maximally disjoint paths between said devices, said maximally disjoint paths being formed by compatible physical links; and

means for establishing said connection over two or more logical links along a respective two or more maximum disjoint paths and aggregating said logical links into a virtual path having said specific traffic parameters.

19. A system as claimed in claim 18, wherein said specific traffic parameters include the bandwidth of said connection.

20. A system as claimed in claim 18, wherein a maximum disjoint path comprises one or more successive physical links connecting a port of a first device with a corresponding port of a second device and all the nodes of said network, said physical links being selected based on their physical characteristics.

21. A system as claimed in claim 20, wherein a corresponding port is a port having similar specific traffic parameters.

22. A system as claimed in claim 21, wherein one of said specific traffic parameters is the port rate.

23. A system as claimed in claim 19, wherein the sum of the bandwidth of all logical links provides the bandwidth of said connection.

24. A system as claimed in claim 18, wherein said means for establishing connection further comprises:

means for selecting a group of one or more logical links for supporting said connection;

means for trying to aggregate said logical links of said group into said virtual path; and

means for ending said link aggregation in the case of an unsuccessful aggregation.

25. A system as claimed in claim 18, wherein said means for
5 establishing connection further comprises:

means for selecting a group of one or more logical links for supporting said connection;

means for trying to aggregate said logical links of said group into said virtual path; and

10 means for establishing each said logical links of said group by allocating an input and an output port on each network node along each said maximally disjoint paths, aggregating said logical links into said virtual path, and exchanging traffic between said devices along said virtual path for a successful aggregation.

15 26. A system as claimed in claim 18, further comprising:
means for monitoring each said logical links of said virtual path for failure; and

20 means for detecting a fault indication at the two end nodes of said failed physical link in the case of a failed physical link on any logical link; and

means for signaling said fault indication to edge nodes connecting said devices over said network.

25 27. A system as claimed in claim 18, wherein said communication network is an Ethernet network.

28. A system as claimed in claim 18, wherein said network is a metropolitan area network (MAN).